FAA AVIATION NEWS

FEBRUARY 1974

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COVER:
Looking for trouble is one way of avoiding it.
See page 7

FAA AVIATION NEWS

DEPARTMENT OF TRANSPORTATION/FEDERAL AVIATION ADMINISTRATION VOL. 12, NO. 10

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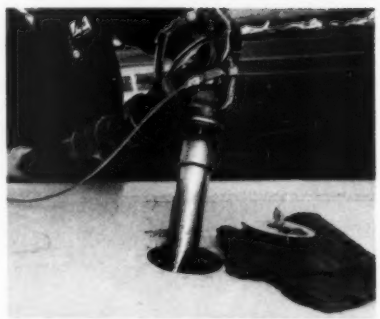

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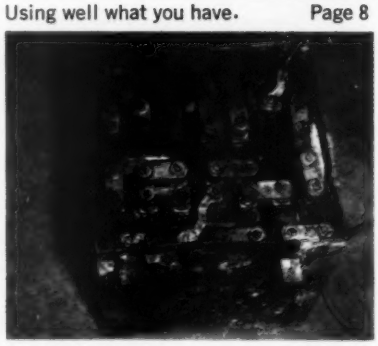

One that got away. Page 10

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Alexander P. Butterfield, *Administrator, FAA*
Louis J. Churchville, *Asst. Administrator, Information Services*

David Gelfan, *Editor*
Gernot Rasmussen, *Art Director* Ruth Taksel Benedict, *Assistant Editor*
Louise Oertly, *Editorial Assistant*

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With a Little Bit of Luck . . . and ATC

More than 3,000 general aviation aircraft got into trouble in 1973 and were guided to a safe landing by FAA's Air Traffic Service specialists in flight service stations, airport control towers, and air route radar traffic control centers thoughout the United States. Six of the specialists were cited by the Federal Aviation Administration for outstanding actions, which almost certainly saved the lives of nine persons on board three aircraft. The citations carried a cash award of $400 each, presented at a ceremony in Washington, D.C. last month. The stories behind these awards are given on the following pages . . . not merely because they make dramatic reading, but also because they point up the fact that trouble is always waiting aloft for the pilot who does not prepare for the unexpected.

With a Little Bit of Luck . . .

Ramon Olivas (left) and Robert Little of the Washington National Tower vectored the distressed airplane and checked on available airports, finally handed off to the Andrews tower.

Washington, D.C.

"Andrews Air Force Base, indefinite ceiling zero, sky obscured, visibility 3/16 of a mile with fog."

Not the most encouraging conditions for landing a six-place twin with the directional gyro out and fuel near exhaustion, but the pilot, Herb Wegner of Madison, Wisc., was running out of alternatives. He had flown IFR from Madison to the nation's capital with five passengers on board without incident until he attempted to land at Washington National Airport, and missed the approach. After his second missed approach, the weather went below minimums for his *Navajo;* a check on conditions at nearby locations disclosed similar weather prevailing all through the area, and forecast to remain so throughout the night.

His best alternative seemed to be Norfolk, Va., some 150 miles to the south. Wegner requested and received an IFR clearance to Norfolk and was given an initial departure heading from the Washington area.

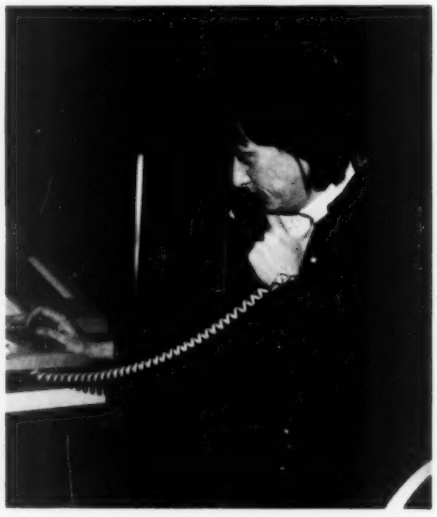
However, an alert departure controller, Ramon Olivas, noticed that the aircraft was not tracking outward on the assigned heading. Olivas issued several heading changes, none of which the pilot was able to execute accurately, but which established the likelihood of a malfunctioning directional gyro. This helped to explain the missed approach at Washington National, but it did not help Wegner in his present situation. He could attempt to proceed toward Norfolk guided by "no-gyro" vectors, but he soon realized that Norfolk was out of his range. Meanwhile, Olivas' supervisor at National, Robert Little, was hurriedly checking all the alternatives.

By now the choice had narrowed down to Andrews, which offered one important feature not available at any other airport he could hope to reach: a PAR (precision approach radar). In a PAR approach the controller is able to watch the progress of the landing aircraft on a split scope. The top half of the screen is a "side view" of the approach that shows altitude and distance to the runway threshold; the bottom half is an "overview" that displays azimuth (and also distance to the runway) of the approach. By monitoring both displays the controller is able to relay information to the pilot which he would otherwise have to obtain from his cockpit instruments.

The aircraft was handed off to Andrews PAR controller Melnee Grant who reviewed "no-gyro" approach procedures with Wegner and vectored him toward the Air Force base while clearing traffic from his path. Norfolk Coast Guard Search and Rescue aircraft were alerted, and rescue helicopters were soon standing by at Andrews and at nearby Patuxent Naval Air Station, as the zero ceiling persisted at the airport. The drama reached its high point of intensity as the *Navajo* pilot, now on final approach, advised that his number one engine had stopped, due to fuel exhaustion—the remaining engine was about to follow suit.

Controller Grant calmly advised the pilot to continue the approach . . . "you're on course . . . a little below flight path . . . fine, you're coming up to flight path, on course . . ." Finally the unbelievably reassuring words—"You're over the runway—on center line!"

Melnee Grant, radar operator at Andrews AFB, used Precision Approach Radar to guide the plane down for a ceiling zero landing.



All that remained was for Wegner to ease off the power and see if the runway was really beneath him, still shrouded in fog. It was there, only a few feet below him, and he landed his *Navajo* without difficulty. A collective sigh of relief was expelled, not only in the airplane, but in the Andrews and National towers, where some 20 controllers had been listening in—and hoping.

Shreveport, La.

"I don't know anything about flying an aircraft."

Strange words to be coming from an aircraft in flight over an aviation communications channel, but there they were, and they just about summed up the frightening situation at Shreveport Regional Airport on that rainy October night. A few minutes earlier radar operator Freddie Laird, and his supervising controller, Raborn Bruce, had been routinely working a Beech *Baron* and monitoring Shreveport's new ARTS III (automated radar terminal system) equipment, which had not yet been commissioned. The pilot of the *Baron* had acknowledged an approach clearance and instructions to descend to 1,700 feet. Then a heading change had been issued, but was not acknowledged. When several subsequent calls were unanswered Laird and Bruce were beginning to assume a radio failure, since the plane was still on course on the radar scope.

Suddenly a man's frantic voice came on the air: *Someone please come in . . . I'm in a* Baron *and my pilot just had a heart attack.*

A short conversation confirmed that the voice was that of James Crosby, passenger in the *Baron;* that he knew nothing whatsoever about piloting a plane; and that the pilot was slumped unconscious over the wheel of the aircraft. Weather at Shreveport airport was measured ceiling 700, broken clouds, 5,000 overcast, visibility two miles with rain and fog.

Laird, an experienced pilot, gave the passenger some quick instructions about the aircraft instruments and their controls, and how to use them. Then he took over responsibility for the other aircraft under Air Traffic Service control in the area, while Calvin Losey, tower crew chief, assumed control of the *Baron.* Meanwhile someone contacted Bennie Voss, Accident Prevention Specialist from the Shreveport GADO, who volunteered to get another twin and go up and try to help.

For the non-flying passenger trying to handle a sophisticated twin-engine aircraft and for those on the ground trying to help him, the next hour was one packed with emotion. There was tension—as the passenger attempted to follow instructions for controlling airspeed and altitude, but reported "I'm just going up and down."

There was frustration—when an attempted rendezvous with an inbound *Gulfstream* succeeded only briefly because of the airspeed differential.

There was gratitude—that the ARTS III installation was working (even if it wasn't commissioned) and that Cal Losey was able to use it so well to keep the trouble aircraft under constant surveillance.

There was concern—when Crosby was unable to throw the control yoke over to his side of the cockpit, and had to continue to hold the unconscious pilot away from the wheel with one hand while he tried to control the airplane with the other.

Cal Losey (left) and Fred Laird found the not-yet commissioned ARTS III equipment extremely helpful in tracking the pilot-less plane during the emergency at Shreveport. Incapacitated pilot recovered just enough to land.

There was excitement on the part of all concerned—when Bennie Voss sped to the rescue in a *Twin Comanche*, and was spotted by the passenger-turned-student pilot with a joyous, "We see you!"

There was admiration—as Voss gave concise and successful instructions to Crosby for making altitude, heading and speed adjustments as he flew escort just above and behind the *Baron*.

There was hope—as the pilot began to regain consciousness and could help with the final seconds of landing, and finally there was overwhelming relief—as the plane touched down a few feet short, bounced once and rolled to a stop on the runway, with Voss in the second plane right behind. A waiting ambulance took the pilot to the hospital, where he subsequently recovered.

The entire episode lasted 63 minutes, the longest hour the participants had ever known.

Cordova, Alaska

When the call for help came into the FAA flight service station, the specialist on duty, Mrs. Jo King, realized almost immediately that the pilot was on the verge of panic. He was flying in snow, and two attempts to climb up out of it had been unsuccessful. Now he was down to 200 feet with very limited visibility. He was an experienced and capable pilot, but not instrument rated, and the weather was socked in but good now. He had filed VFR to the Cordova Airport from Cape Yakatago, little more than a 100-mile flight along the Alaskan coastline, but a 40 knot wind and an unexpected snow-shower had combined to put him into big trouble. Within a few minutes after he had called requesting a DF steer through the snow he was reporting an airspeed of 200 knots (his Cessna 180 redlined at 170 knots) and he could not reduce it.

Fortunately for this young pilot, Mrs. Jo King happened to be one of the most proficient pilots in Alaska. She has been flying since she was 13, and picked up her experience as a bush pilot, air taxi operator, flight instructor and fish spotter, as well as from her FAA training. She recognized the pilot's predicament as a highspeed spiral in white-out conditions. Her instructions were terse, deliberately so, to shock the pilot into corrective action:

"Dammit, turn loose! Level the wings! Then bring the nose up!"

She held her breath, sensing an imminent catastrophe for the low-flying airplane.

Seconds later the pilot called in to say that his wings were level and the airspeed coming down. He added in a still frightened voice that he had bounced his wheels on the ground during the pullup. It had been that close.

Since the pilot apparently could now see some trees, Mrs. King suggested that he circle them until he felt relaxed enough to continue his flight. Soon he was following the tree line north. Based on his description of the terrain, and the knowledge she gained from her DF bearing on his airplane, Mrs. King decided that he was on the west shore of the river delta, south of the point where Copper River highway hopscotches from island to island over a ten mile expanse of water. She warned him not to cross the road or bridge, aware that just north of the highway there were glacier ridges and mountain peaks up to 6,000 feet. And she urged him to keep an eye on his artificial horizon and ball/bank indicator to avoid dropping off into a spiral again.

But now the pilot reported a new problem: he was picking up wing ice, and the pitot tube was also apparently icing up. He was having trouble with the airspeed indicator and the compass was unstable. He was still fighting to stay aloft, with three notches of flaps, when he sighted the road leading to Cordova Airport, and followed it in.

Earlier, Mrs. King had taken the precaution of asking another specialist, Francis Brown, to stand by, just in case the young pilot gave signs of needing a stern masculine voice to assist him on landing in the snow. This proved unnecessary, as the aircraft landed without incident. *R. T. B.*

Jo King of the Cordova FSS credits her flight instructor experience for her prompt reaction when a pilot was spiraling toward the ground. Aircraft bounced wheels in pulling up.

Runway Runaways

". . . pilot stated he made a low pass over the snow-covered airfield and observed what he thought to be aircraft wheel tracks on the runway. Accordingly, he made a routine approach and landed. On rollout the nose-gear of the aircraft went through the ice crust on top of the snow and collapsed. While examining his bent propeller the pilot noticed two significant facts that had escaped his aerial observation: 1) There was a foot of soft snow beneath a thin crust, and 2) the existing tracks on the runway were from snowmobiles, not airplanes."

This rueful narrative, from a recent FAA incident report, is typical of the many wintertime runway mishaps which take place during this season because pilots misjudge the conditions of runways, overestimate their capability, or lack the skills required to control aircraft on the ground in marginal conditions. There are conditions when aircraft without skis may be landed or taken off safely on snow, and there are also conditions when this is not possible, or at best chancy. If you are not familiar with this type of operation, the only safe practice is to get the opinion of a local expert, FSS, or GADO inspector before you try it—especially when planning to land on a snow-covered runway. If you are already on the ground, you have an opportunity—which you should not neglect, regardless of any reasons for haste—to examine the surface beforehand, and even taxi over it a few times. But from the air, all snow looks alike to neophytes, and any change in the sky conditions or air temperature can bring about a signicant change in the makeup of runway snow—from soft snow to crust, to ice, to slush—in a matter of hours or less. "If the runway is not clear, you have reason to fear" . . . or at least be very cautious.

Even where the runway is mostly clear or in areas where snow does not accumulate, runway surfaces at small or lesser used general aviation airports tend to become less reliable at this time of year. Rain or dew may freeze into spotty patches of ice. Frost may heave concrete up or crumble it. Standing water may create swampy conditions. Any of these circumstances promote the likelihood that a light aircraft may experience problems with directional control on the ground, unless the pilot is alert to this possibility and capable of reacting properly.

He has to remember, on landing, that his braking may be uneven on a runway that is not clear and hard; if one wheel is running on ice or mud, while the other is on pavement or firm turf, incautious braking may slew the aircraft around. Under some wintertime conditions, brakes may be completely useless, and the pilot must take this fact into consideration before committing himself to a landing.

He must also anticipate that, on takeoff *or* landing, if one wheel hits a pothole or an ice patch, the aircraft is likely to yaw abruptly and he must be prepared to counteract that tendency at once, or the yaw may get out of hand and the airplane wind up in the woods. This is particularly true of tailwheel aircraft, where the center of gravity is behind the main wheels, and the tail section, when elevated from the ground, carries considerable moment.

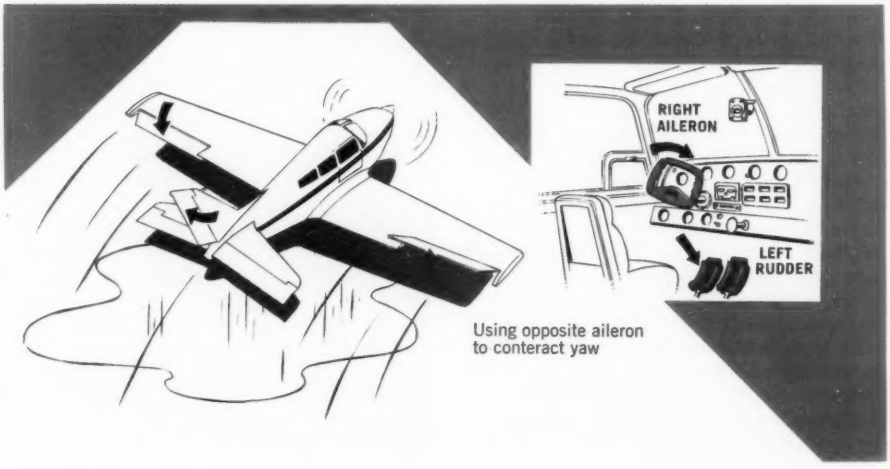
The rudder, of course, is the primary directional control on the ground, but there are conditions when the ailerons are capable of assisting the pilot in keeping his aircraft properly aligned with the runway, and he should be correctly informed on how they affect the movement of the airplane on the ground.

There is a popular but erroneous notion that raising an aileron will help turn the aircraft on the ground in that direction—the assumption being that the upraised aileron travels farther than the down aileron, and hence creates more drag on that side of the aircraft. However, engineers will tell you that, aerodynamically speaking, it is not the length of travel, but the configuration of the aileron relative to the wing, that determines the total drag. In point of fact, *down aileron creates the most drag*, so that if you are yawing severely to the right and you need to assist the rudder with aileron, you turn your wheel to the right (*see illustration*). This can be confusing, because in the air you turn the wheel in the direction you wish to turn, not in the opposite direction.

One habit that must be guarded against when taking off from slippery runways is premature rotation. Three wheels on the surface—particularly when one of them is a steerable nosewheel—gives you much better directional control than two. If you are having directional control problems during takeoff over a slippery surface, you may be tempted to yank the bird off the ground early. Giving in to a temptation like this could result in rapid worsening of a yaw, due to torque effect, and serious trouble in recovering control of the aircraft.

Many of the accidents that occur in the late winter or early spring at small airports happen to pilots who last flew at the airport before the bad weather set in, and who do not make allowances for winter deterioration of the runways. In the time intervening, trees may have fallen on a runway, sleds or snowmobiles may have been abandoned on it, soggy springs may have penetrated it, floods may have washed over it, woodchucks may have burrowed into it—in short, it may have been taken over by any of Nature's creatures or forces. This is especially likely if the airport owner has wandered off to Florida or Mexico for an extended winter vacation.

All of this adds up to the practical habit of never committing yourself to a little-used runway you have not inspected carefully or checked on, except in a genuine emergency. It may not be as solid as it looks. In fact, there may be some very solid reasons why pilots are avoiding it. ■



Using opposite aileron to conteract yaw

Tell Us Your Troubles

Maintenance Symposium airs new approach to equipment upkeep

A policy aimed at increasing reliance on "letting the machine tell us what is wrong, and when", presented at the ninth annual FAA International Maintenance Symposium in December, offers encouraging prospects to aircraft owners and operators as well as the air carrier industry for eventually lowering the rate of accidents due to malfunction, and for lowering the costs of maintaining an aircraft.

As explained by James E. Dougherty, Acting Chief of FAA's Flight Standards Maintenance Division, in his address to the more than 750 attendees, the agency believes that more effective use of information gathering, analyzing and distribution systems can result in earlier detection of faulty equipment, with less reliance on scheduled overhaul. The sooner the problems come to light, the sooner correction of design or improvement of maintenance practices can be made, with the consequence of safer equipment for users of aviation.

As an example of the new policy in action, Dougherty drew attention to a trial program of publishing daily summaries of selected general aviation malfunction or defect reports, so that information regarding specific problems which might have a broad application are disseminated on a nationwide basis quickly—usually within about four days. (These general aviation daily summaries are not to be confused with the air carrier daily summaries that have been circulated for many years.)

Since most general aviation users are not required to file malfunction or defect reports, this type of data is not complete, and in many cases this has increased the difficulty of early detection of mechanical problems. At the present time, technical causes are responsible for approximately one out of every five accidents in general aviation. Dougherty hopes to interest more and more pilots, aircraft owners and mechanics in filing malfunction reports with their FAA Flight Standards District Office.

To further simplify this task, the agency now utilizes a single form (8070-1) for both air carrier and general aviation malfunction reports, whereas previously a separate form (8330-2) was required for general aviation problems. (The latter form is still accepted at District Offices if presented.) The combined form has the added advantage of exposing certain problems which are actually common to both large and small aircraft, and results in a "cross-pollination" of ideas.

Representatives from 40 foreign countries were among those enjoying industry exhibits and technical programs at the symposium, sponsored annual by FAA and open to the public.

One of the problems yet to be solved is *maximum* distribution of the daily summaries. It may be necessary to establish a subscription system, in order to defray the heavy costs of handling and mailing. The cost to the individual user would be relatively low, in terms of the potential savings (in life and limb, as well as money) that can be effected as a result of early notification of defects that can be averted by updated maintenance procedures or product improvements.

Dougherty also mentioned that FAA was preparing a revised regulation that would remove amateur built, exhibition and air racing aircraft from the experimental category after initial testing; that the rules for aviation maintenance technician schools had been completely overhauled; and that the agency had contracted for a 1974 "National Study of the Aviation Mechanic's Occupation."

Another significant announcement at the Maintenance Symposium was the establishment of an Aviation Mechanic Rrefresher Clinic, co-sponsored by FAA and AOPA (Aircraft Owners and Pilots Association.) A counterpart of the highly successful pilot and instructor refresher clinics, similarly co-sponsored, the mechanic clinics will be held frequently throughout the year at varying sections of the country, with support from industry and state aviation representatives. A trial clinic was scheduled for February 13 and 14 at Columbus, Ohio. Topics presented by FAA include a description of the Service Difficulty Program; a discussion of the mechanic's responsibilities for aircraft maintenance and alteration; and a working definition of "minor" and "major" alterations.

FAA's Jim Dougherty, Chief of Flight Standards Maintenance Division, explained the benefits of the service difficulty reporting program.

The dates of forthcoming regularly scheduled clinics which will be open to all mechanics for a nominal fee, will be announced soon in this magazine.

On the air carrier side, an impressive industry representation reported on the success of FAA-supported programs emphasizing *condition monitoring* as a safer and more practical maintenance policy than one depending largely or wholly on "hard times" overhauls. Condition monitoring calls for a constant reporting of equipment performance, which compares both base line data and specified trouble indications for purposes of determining when replacement or overhaul is required. Instead of attempting to establish a standard life expectancy for parts, the part itself is permitted to determine its individual longevity. This policy takes into consideration the fact that the manner and condition in which equipment is used plays a major role in its durability, along with appropriateness of design.

This type of maintenance obviously calls for greater reliance than ever before on the alertness and intelligence of maintenance personnel, not only in accurately monitoring the health status of equipment, but in skillfully judging the results of assembled data. The prospect is for a general upgrading of the professional status of maintenance work. ■

Making the Best of It

It is a different ball game when you can't fuel around wherever you wish.

Incident in Kansas: A low-time private pilot who has not flown for several months is scheduled to make a business flight alone in his single-engine airplane. Although he would normally refresh his technique by having an instructor accompany him on a few landings, this time he hates to "waste" his gasoline, so he goes off alone, assuming "it will all be there." He is unable to handle a gusty crosswind on takeoff, and the airplane flips over. Although there are no injuries he has extensive—and expensive—damage to the aircraft.

Incident in Colorado: A commercial pilot, apprehensive about fuel availability enroute, attempts a takeoff in his six-place single-engine airplane after filling all fuel tanks *and* all seats. He is aware that the allowable load limits for the airplane have been exceeded, but feels confident, unconcerned, since he has taken off overloaded before. This time, however, a slight slope to the runway does him in. The plane staggers into the air and clips some tall trees off the end of the runway. Pilot manages to get the plane back on the ground but landing gear, prop—and pilot ego—suffer damage.

Incident in Texas: In an ill-advised effort to conserve fuel a pilot attempts to take off using reduced power settings. By the time he deduces it is not going to work he has run off the end of the runway into the mud.

Incident in New Jersey: A single-engine four-place aircraft explodes and burns following a hard landing and bounce accident. The pilot dies in the fire. Investigators are puzzled at first, since the impact was not severe. Probable cause: ignited fuel vapors, emanating from two cans of gasoline he was carrying on the floor behind the seat.

Incident in Pennsylvania: A weekend pilot, attempting a Sunday cross-country flight, finds his planned refueling stop is out of gasoline and flies to the next airport. He is unable to buy fuel there, and starts off for a third location. The engine quits 15 miles from his destination, resulting in a forced landing, minor injuries to pilot and passenger, and considerable damage to the aircraft.

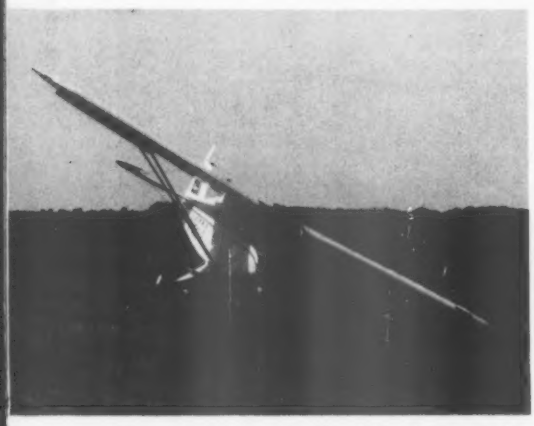
Incident in Georgia: During an inspection following an inflight engine failure, an engine is found to have scarred and damaged pistons. It is learned that the pilot has been flying with an excessively lean mixture in an effort to save fuel.

The above are typical of the kind of accidents associated either directly or indirectly with the present shortage of aviation fuel. It would not be correct to say that they were *caused* by fuel shortage: rather, they are caused by pilots pressuring themselves into unsafe practices. Although the extent of the energy crisis, and its long range effect on general aviation are still a matter of conjecture, one thing is sure: gone are the days when a pilot was free to waste as much fuel as he could afford to pay for. All alert flyers share a new-found sense of awareness and foresightedness—not unlike that of the depression years—that compels us to use our resources wisely. Every gallon of avgas must be made to count—but there is a little more to it than simply figuring out how most efficiently to get from point A to point B. There is another very important factor involved: *safety*.

Endeavoring to continue flying in a period of short fuel supply inevitably creates a pressure type of flying similar to "get-there-itis"—the malady that causes a pilot to cut corners regarding safety in order to satisfy a strong desire to fly to a given place at a given time. Get-there-itis has killed many a pilot, and injured scores. The irrational desire to fly to a given point regardless of fuel shortages can be equally costly in human lives and property.

The question the sensible pilot asks himself is not, "How can I manage to fly there with the limited fuel available?" but rather "Is it possible for me to fly *safely* with the limited fuel available?" If the answer is negative, he finds some other means of traveling. He lives to fly another day.

In an effort to prevent the fuel-related accident rate from rising, FAA Accident Prevention personnel have embarked on an educational campaign designed to alert pilots to the types of mishaps that may be expected, and to set forth basic common-sense guidelines that can help keep fuel accident statistics to a minimum. Three of the most important subjects of the APS educational program in the months to come could be headed, "The Three P's": Proficiency, Planning and Preflight. If accident rates do not rise because of the fuel shortage it will almost certainly be because these all-



One way not to economize is to skimp on the power when you need it to control the airplane.

important pilot responsibilities have been given greater attention.

Proficiency. When you fly less it is more important to keep your skills sharpened. Whatever the months ahead have in store for the private flyer—whether you are able to get all the fuel you want or have only a small allocation to work with—do not squander it all by boring aimless holes in the sky. If you are a low-time pilot, be sure to spend at least part of your flying time in takeoff and landing practice—particularly in a crosswind. (If you can make a skillful crosswind landing, a normal setdown will be a piece of cake.) Now more than ever it may be worth your while to hire an instructor to go along with you, to see that you are getting maximum benefit from your practice time. Sightseeing in an airplane may be fun, but it is not as constructive as hard practice. With the increased price of fuel, pilots who would normally hire an instructor to go along while they do some touch and go landings after a period of inactivity could be deluded, under the guise of economy, to go out alone to "get current." This is poor economy if pilot rustiness leaves you with a bent or broken aircraft—or even personal injuries.

In addition to landing practice you should also brush up on your navigational know how, whether you fly by airway or eyeball. Many fuel exhaustion accidents happen to VFR pilots who get lost and use up all their gasoline before they find a place to land, a situation that may also be complicated by low ceilings, poor visibilities, or impending darkness. Regardless of fuel availability there is never enough to waste by getting lost, so be sure to watch where you are going.

Since flying in a straight line uses less gasoline per trip than doglegging it between VORs, some pilots are going to disregard airways and radio navigation, and go back to simple "piloting."

This is a safe and reasonable procedure if—you make certain that the weather is VFR all the way down to the ground over the entire projected route, and if your piloting skills have not gone rusty with disuse. Are you really familiar with the terrain? How many superhighways have been built since you last followed the two laner from Hattiesburg to Emmitsburg? If you are going to fly at altitude for more efficient performance, will you really be able to see landmarks through the smog that overlies so much of the country? Ten or twenty years of relying on radios for navigation builds up specific flying habits, and wears down others, so before you start blazing your own trails over unfamiliar country make certain that you are capable of doing so without getting lost.

Most pilots are in the habit of flying in the manner that gets them to their destination with the least expenditure of time. When the least expenditure of fuel is a paramount objective, another new set of habits have to be learned. If you have never worried much about leaning because you mainly fly at lower altitudes, this is a good time to study up on your manufacturer's recommendations for fuel mixture. The operating range of your aircraft with full tanks is directly related to correct, or optimum, mixture and airspeed. Actual range differs slightly with each individual aircraft, so unless you have checked out your plane personally, you had better add a safety margin to the distance given in your owner's handbook.

Danger in Thrift

A well-planned and executed landing that does away with the need for sudden bursts of power is a less obvious example of how proficiency can save you a little fuel. On the other hand, nothing could be more foolish than a reluctance to add power whenever needed to assure proper control of the airplane. Probably the worst possible example of suicidal thrift is the pilot who tries to take off with reduced power settings, or who pulls back on the throttle before climbing out to a safe altitude. There are enough ways to save on fuel without risking life or limb. Knowing what you are capable of doing, and doing it to the best of your ability, will give you maximum fuel economy *and* safety.

Planning. It has always been known that many aircraft accidents originate in the planning (or non-planning) stage, and now there is an even greater likelihood that poor preparation will get you into trouble. There are new items to be added to the flight planning routine—where once it was enough to plot strategically located refueling spots along your course, now it is irresponsible to start out on a flight without telephoning ahead to be sure you can get enough of your kind of fuel when you arrive. Just in case your well-laid plans do not work out be sure to have an alternate plan of action. Make a note of other landing possibilities along your route, find out their normal hours of operation and see if they have UNICOM. You might also want to find out whether the line service at the destination airport remains open if the fuel supply runs out, and if it appears that they might be closing early it would be wise to carry oil in your plane. It is conceivable that you might be stopping over at an airport that is not attended and you will not need refueling, but will need to add oil. ***Never attempt to carry gasoline in cans in the airplane, though—it is both illegal (except in unusual cases) and extremely dangerous, and might even void your insurance.***

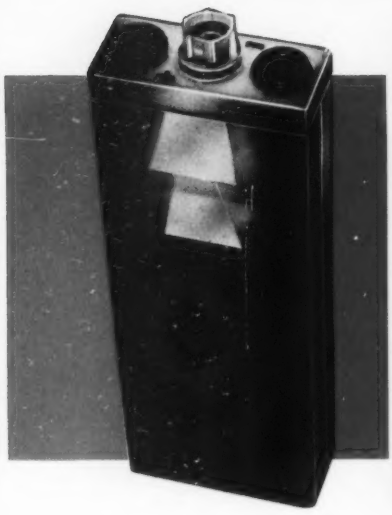
While you are planning be sure to plan some flexibility into your schedule—i.e., admit the possibility that you might run into a situation where you may have to leave the airplane and wait out a fuel delivery, or continue by other means of travel. Worse things can happen to you—and possibly will—if you choose to try squeezing more out of your tanks than was poured into them. It is better to wait at a comfortable airport cafe or motel, than in a crumpled airplane in the middle of nowhere.

Checking weather and winds aloft becomes a particularly important part of your planning if you do not have a lot of reserve fuel aboard. Circumnavigating rain or snow showers, getting off course because of poor visibilities, or losing time to headwinds can all use up precious gallons of gasoline.

Preflight. The less frequently an airplane is flown, whether for reasons of fuel shortage or other, the more important the preflight inspection becomes. In many respects an idle aircraft deteriorates faster than an active one. Disuse encourages rust, both in the engine and airframe as well as moisture, dirt and oil accumulations, and foreign deposits from plant and wildlife. Make sure the magneto drop is well within the safe range, and that full power is available. Check all control responses and if any seem soft or overly resistant, do not assume that it will smoothen out once you are in the air—have a mechanic look at it now.

These precautions are in the interest of economy as well as safety. An out-of-tune engine or an out-of-rig airframe can slow your airplane considerably in flight, and thus contribute to your fuel management problems. Incidentally, another poor example of the silly gas saver is the pilot who skimps on sump drainage when checking for water in the fuel.

Historically, general aviation accident rates have tended to go up in relation to decreased flight activity, but this does not have to be an inevitable consequence of the fuel shortage. Intelligently using the resources we have can make for interesting as well as safe flying. ■



Protection for NI-CADS

The latest FAA Airworthiness Directive concerning ni-cad batteries has extended a previous Directive which made February 1, 1974, the deadline by which time all aircraft using ni-cad batteries for engine or auxiliary power unit starts (except those already equipped with a thermal runaway protection device) must install one of three types of devices:

- A battery charging rate control system.
- A battery temperature sensing and over-temperature warning system; plus an operating procedure for disconnecting the battery from the charging source in the event of a battery over-temperature warning.
- A battery failure sensing and warning system; plus a procedure for disconnecting the battery from the charging source.

The deadline is now extended up to April 1, 1974, if operators present a satisfactory program for compliance, and if additional specified limitations are observed during this period. Any operator of a ni-cad equipped aircraft who has not received these ADs should contact his nearest Flight Standards District Office.

These high performance batteries, which are also rather costly, are finding their greatest usage in turbojets or commercial aircraft. But they are also being used increasingly in the general aviation fleet, even in non-jets. Some estimates place the usage of ni-cads in the general aviation fleet today at 10%.

The ni-cad battery is a multi cell battery (usually with 19 to 22 cells), with plates of nickel. As an electrolyte the ni-cad uses a solution of potassium hydroxide and distilled water (chemically this is just about the opposite of the familiar sulfuric acid solution of the lead-acid batteries). Furthermore, the electrolyte in the ni-cad does not react chemically with the plates, as does the sulfuric acid of the lead battery. Current is developed when the electrolyte converts the electrodes from nickel or cadmium nitrates to nickel or cadmium hydroxides. This unique type of construction enables the ni-cad to deliver a high current capability in a small package for engine starts and to offer other advantages, such as resistance to low temperatures, long life, speed of recharging, etc.

The fact that ni-cad batteries discharge at high rates and take on new charges at equally high rates, is what makes the phenomenon known as thermal runaway a potential danger.

Basically, thermal runaway is an uncontrollable rise in battery temperature that will ultimately destroy the battery. In the process, the smoldering battery could short out the entire electrical system of the aircraft, spew out corrosive chemicals that damage other vital parts, and even set the aircraft on fire. The two conditions necessary for the onset of thermal runaway are **elevated battery temperature** (in excess of 140° F.) and **overcharging.**

Overcharging is the continuation of charge current from the aircraft's generating system after the battery is completely charged —it does not refer, in this context, to charges emanating from a ground of bench source. Normally, when the battery potential approaches full charge, the input from the charging source will diminish to zero. However, excessive heat within the battery can lower the effective internal resistance to the point where it will accept additional charging, or overcharging. The overcharge in turn creates more heat, which in turn further reduces the internal resistance, inviting continuing charge, etc., until the condition accelerates to a degree that results in fire or explosion.

Thermal runaway can be stopped by disconnecting the battery from the charging source.

With the increased use of the high performance ni-cad batteries there have been a growing number of reports of thermal runaway, fortunately not many of them with fatal consequences, but enough near-misses to make intelligent pilots sensitive to the demands of the ni-cad.

For example, one pilot barely made it into the Wiley Post Airport at Bethany, Ok., in April of 1972. The pilot, who was 51 years old and had a commercial license, was ferrying a businessman from Miami to Bethany in an Aero *Commander* 680. The *Commander* was in its final approach to Runway 35R when the pilot began to smell strong smoke fumes. At that moment he was still two miles out and at an altitude of 3,000 feet, and he had no idea where the smoke was coming from. But the control tower spotted it immediately, and controllers informed the *Commander* pilot that intense smoke was coming out of the tail section.

The gear was already down, and so the pilot immediately shut off all his electrical equipment. with the smoke still trailing behind him, he then managed to get the *Commander* down in a relatively smooth landing. Fire trucks raced to the airplane, and in a few minutes they quickly located and extinguished the fire in the aft section.

A subsequent investigation revealed that the ni-cad battery located just aft of the baggage compartment had run away and burned up, causing substantial damage to the interior and left hand side of the aft fuselage. The pilot was extremely fortunate that his ni-cad had waited to act up until he was in his final run. A few minutes earlier and he would have had a flaming airplane in the sky.

Not quite so lucky was the pilot of an MU-2, a twin engine turbo prop which was making what appeared to be a perfectly routine flight from Rocky Mount, N.C., to Columbia, S.C. The pilot, a 45-year-old veteran flyer with a commercial license, was flying alone in the corporate airplane, on his way to pick up some passengers.

At 3:03 p.m. Jacksonville air route radar traffic center established radar contact with the MU-2, monitoring it as it made its way southwestward. It was then 40 miles northeast of Florence, S.C., and flying at an altitude of 12,000 feet. Eleven minutes later the center again tried to establish radio contact, but this time there was no answer. The airplane was still on the scope, but repeated radio calls went unanswered.

There was a growing sense of apprehension in the center as the unresponsive blip on the scope continued its silent flight southward. Then at 3:17 radar contact was lost.

What the controller at the center did not know was that one of the nickel-cadmium batteries, located in the right wheel well, was literally burning up the airplane. The ni-cad had overheated, and then erupted into fire: another case of "thermal runaway."

Witnesses at Alcolu, S.C., later stated that they saw the MU-2 streaking toward the ground in a right wing low attitude, obviously out of control, a stream of black smoke trailing behind it. It hit the ground just east of Highway I-95 at the edge of a wooded area, bursting into flames. It was demolished on impact. Pieces of the airplane shot through the woods, and these fragments were later recovered as far as 600 feet from the point of initial impact. The pilot was killed instantly.

NTSB investigators were able to collect the scattered parts of the malfunctioning ni-cad battery. Their tests showed that there had been an in-flight fire in the battery, and that the battery cell plates were in various degrees of heat disintegration. The edge of the battery case had been burned away, and it was estimated that the temperature must have exceeded 2,600 degrees F.

These incidents should not be interpreted to mean that the nickel-cadmium battery is an essentially unsafe piece of equipment in the airplane. Indeed, manufacturers insist that the ni-cad is no more failure-prone than any other system on the modern aircraft. But these high-performance batteries are quite sophisticated pieces of equipment, and that does mean that they require more perceptive care and maintenance than conventional lead-acid batteries.

The prevention of thermal runaway begins with good operational, maintenance and overhaul practices:

Operations

1. Use external power for starts when a series of short duration flights or consecutive engine starts are planned. Excessive engine cranking leads to overheating.

2. Monitor the aircraft bus voltage frequently to see if there is any significant fluctuation of current. An increase in the load or charge current with no additional circuits being energized, especially during normal cruise, may indicate battery overheat. Land and check it at the first opportunity.

3. Do not use the aircraft batteries unnecessarily to run auxiliary equipment on the ground—such as lights, avionics, ventilations systems, etc.

4. Make sure there is good ventilation of the battery compartment, particularly during ground operations in hot weather. Additional ventilation can be obtained by opening the battery compartment access door (on the ground only) or using forced air.

Maintenance

1. Visually inspect the battery and associated hardware on a regular basis, particularly for leakage or signs of overheat.

2. Follow the battery manufacturer's instructions concerning periodic servicing, capacity checks, and reconditioning procedures. In servicing a ni-cad, separate shops, equipment and tools should be used from those used for lead-acid batteries. Anything associated with lead-acid batteries, including acid fumes, can cause severe damage if it comes in contact with a ni-cad battery or its electrolyte.

3. Have authorized battery service man check fluid level in cells, and add fluid if necessary. (Do not attempt to do this yourself.)

Overhaul Practices

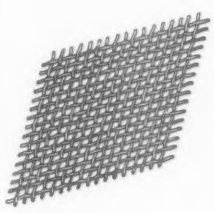
1. More than one overhaul of a ni-cad is not recommended.

2. Manufacturers do not recommend mixing cells in the ni-cad—that is, a mixture of new cells and overhauled cells.

3. In addition to the standard quality control procedures, the plates should be inspected carefully for evidence of burned, crimped, or frayed edges, hot spots or other damages. Damaged cell plates or stacks should be discarded.

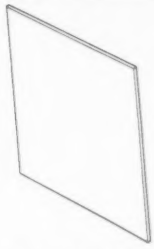
Thermal runaway can be eliminated completely with proper attention to these details, together with installation of an approved protective system. Ni-cads are an excellent source of power, but a potential fire bomb if abused. If you abuse a lead-acid battery, it simply dies on you. If you get careless with a ni-cad, it could turn your kite into a comet. ■

Construction of typical nickel-cadmium battery.

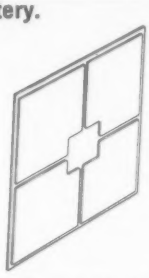


1. Construction starts with a nickel screen

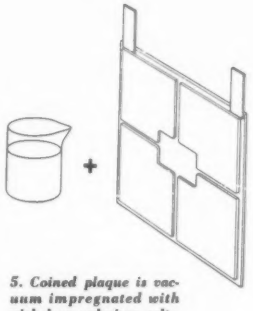
2. Then nickel powder is sintered about screen.



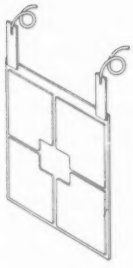
3. This forms a plaque approximately 80% porous at this stage.



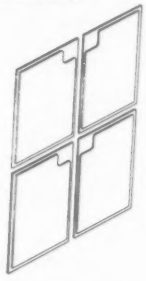
4. Plaque is coined with a plate die.



5. Coined plaque is vacuum impregnated with nickel or cadmium salts, electrochemically deposited within pores.

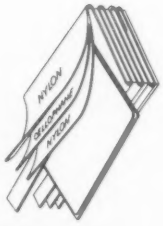


6. Current is passed through plaque in presence of electrolyte, to convert nickel or cadmium salts to final form.

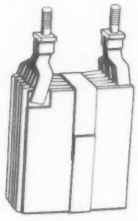


7. After washing and drying, finished plaque is cut into plates.

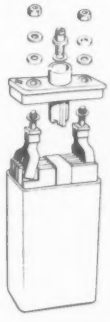
8. A nickel tab is spot welded to plate.



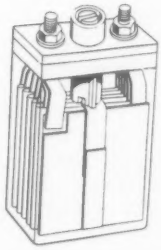
9. "Stackup" is prepared by folding separator material between alternate positive and negative plates.



10. Nickel terminals are welded to completed "stackup," which with its cellophane binder forms the complete assembly of the core.



11. Cover and vent assemblies are attached and sealed to "stackup."

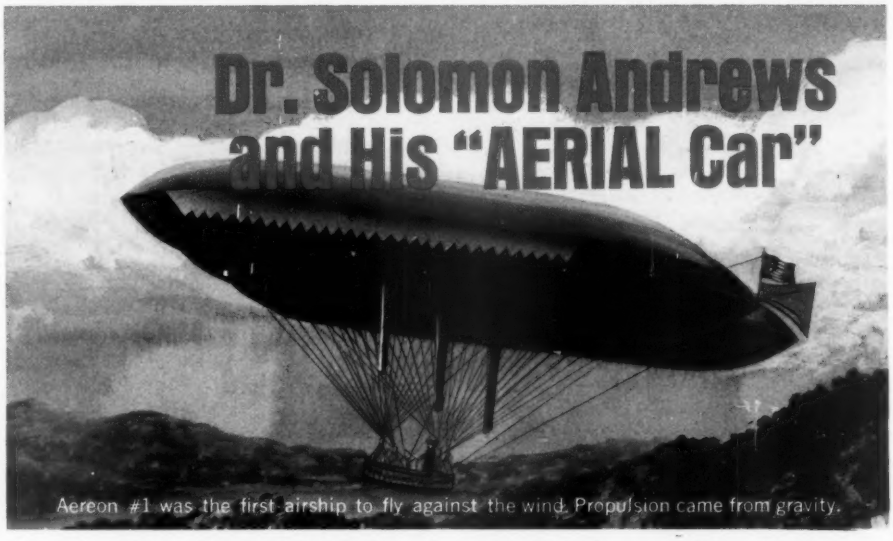


12. Entire unit is inserted in cell case and sealed.

(Diagram courtesy of Marathon Battery Co.)

Famous
Flights

Dr. Solomon Andrews and His "AERIAL Car"



Aereon #1 was the first airship to fly against the wind. Propulsion came from gravity.

Solomon Andrews was a prominent physician and surgeon, a practical inventor, three-time mayor of Perth Amboy, N.J., and—the designer and pilot of the first lighter-than-airship with controlled flight. His imaginative efforts in the field of practical aerial reconnaissance during the Civil War were eventually frustrated by skeptical officials and businessmen, but his work stimulated later airship production in America nearly three quarters of a century after his first flight.

Born in Herkimer, N.Y., in 1806, the son of a Presbyterian minister, Andrews had a fertile, innovative mind. He is credited with 24 practical and successful inventions, including a fumigator and a forging press, a kitchen range, a gas lamp, a sewing machine and padlock that has been used by our Post Office for over 130 years, and which netted him over $30,000.

As a youth, although he showed great mechanical ability, he studied medicine at his father's suggestion. Moving to Perth Amboy in the early 1830's, he built up a good medical practice, got married, had seven children and was credited with saving the city from an epidemic of cholera. He was appointed alderman at the age of 29 and in later years was elected mayor for three terms.

At age 41 he was one of the founders of the "Inventors Institute" of Perth Amboy, and in 1848 laid before it a unique plan for "Navigating the Atmosphere . . an invention of no ordinary magnitude, necessarily expensive in experimenting upon and requiring more capital than individual enterprise is likely to furnish." According to a booklet he published in 1848, labeled "Aerial Navigation," Dr. Andrews planned to sell some donated property in Perth Amboy to raise $15,000 for his "Aerial Car." He felt sure that with his invention ". . . the Government would be relieved of embarrassments in transporting the mails."

In the same booklet, he noted that ". . . any information respecting varnishes suitable for permanently retaining hydrogen gas in silk or other fabrics will thankfully be received at the Institute." As adequate funds were not collected, Andrews' plans were stalemated.

Shortly after the outbreak of the Civil War, Dr. Andrews entered the service as a physician with the Union forces. Observing the limitations of Professor T. S. C. Lowe's spherical balloons (which were tethered to the ground by two long cables) for military reconnaissance, he proposed, in a letter to President Lincoln, the building of a "War Aerostat" to go up to ". . . ten miles into *secesh* and back", thereby getting far superior aerial observation. Receiving no reply he next contacted Secretary of War Stanton, who requested drawings, details and a description of the proposed airship.

There followed a period of frustrating rebuffs, while reports were lost and protracted correspondence delayed any decisions. Mr. Lincoln appeared personally interested in Dr. Andrews' idea, but apparently did not sustain his enthusiasm. Andrews therefore decided to build his airship on his own.

Back in Perth Amboy he induced many patriotic minded citizens to volunteer to help. He corraled seamstresses to sew the 1,200 yards of Irish linen needed, one of the major jobs, and secured the services of a noted balloonist to make the muslin cells that would hold the hydrogen gas. The airship, the *Aereon*, was completed near the end of May, 1863, at a cost of $10,000 and was ready for a flight on June 1.

The craft consisted of three parallel cylinders 80′ long and 13′ in diameter, pointed at both ends, filled with hydrogen, and secured together by portions of the material of which they were made—"varnished linen." A car, 12′ long and 16′ wide, was suspended below by cables, with a moveable weight on tracks to shift the center of gravity forward and aft. At the rear of the central cylinder, or gas bag, was a vertical rudder for steering right or left.

Probably its most unusual feature—certainly of interest today, in a power-hungry world—was its lack of mechanical motive power. *No engine.* No flapping wings, blades or propellers. Yet (its inventor claimed) it could take off, rise to a desired height, travel over many miles even against the wind, and make a gentle landing. *How? Its dirigibility was generated by using the force of gravity.*

Solomon Andrews explained this unusual method of navigation in his Patent No. 43,149, dated July 5, 1864. After describing balloons and their dependence on air currents and their method of going up or down by ballast, he stated ". . . *if a balloon were made in any other shape and kept suspended by the center of gravity in an oblique position, it will ascend or descend . . . on the line of least resistance. Thus, if made in a flattened and elongated form and kept in an oblique position, it will ascend or descend in the plane of its longest axis, because it meets with less resistance in that direction, and thus produces a forward movement. . . . When two (or more) cylinders are placed horizontally side by side, there is formed between them a longitudinal cavity both above and below. This concave surface offers more resistance to the air than a convex or plane surface, consequently rapid ascent and descent perpendicularly is prevented, and the power of ascent or descent is expended by forcing the body to move obliquely upward or downward in the line of least resistance, the cylindroids sliding, as it were, on an atmospheric railway.*"

The angle of inclination of the airship would be produced by the position of the aeronaut or the ballast in the elongated, suspended car, the bottom of which was a curved line or arc of 30°. The forward movement of the *Aereon* could be visualized as a series of inclined movements up, as ballast was unloaded, then down, as gas was valved; with its horizontal direction controlled by the rudder. Progress would be affected to a degree by strong or contrary winds and the duration of flight by the amount of ballast and gas carried.

The first flight of *Aereon #1* took place on June 1, 1863, when Dr. Solomon Andrews stepped into the suspended car and shouted "cut loose!"

The machine, inclined at a slight angle, shot forward and upward rapidly, turned into a head wind where it apparently stood

Dr. Solomon Andrews, who in 1865 made motorless flights over Manhattan in his airship.

still for a while, then wheeled back from an altitude of 200 feet and coasted to a gentle landing. Other trials were made that summer and the following year, each with improvements in the ship and flying techniques.

In December of 1863, Dr. Andrews petitioned Congress again to examine his invention, and, after further delays, a committee of three was appointed including the Secretary of the Smithsonian Institution, Professor Joseph Henry, a leading scientist. The Committee was sufficiently impressed to recommend a suitable appropriation for its full-size construction, but as the war approached its end, Congressional interest waned.

At the close of the war, in 1865, Andrews purchased two large army surplus balloons, the *Union* and the *Intrepid*, which he used for a new *Aereon*. In the same year a New York firm, the Aerial Navigation Co., was formed by a few men who believed in the future of Andrews' invention, and installed him as president. On its maiden trip, *Aereon II* with four passengers rose from its New York moorings, flew over Harlem and the East River at 2,000 feet and finally landed in Astoria on Long Island. Although disappointed that he could not return to his take-off spot, Dr. Andrews was satisfied that he had established a major principle of flight and that aerial navigation was no longer a myth, or beyond human possibility. He believed firmly that gravitation was the sole motive power needed for navigating the air.

Before he could gain recognition, the post-war economic panic wiped out hundreds of banks, thousands of businesses *and* the Aerial Navigation Co., whose backers disappeared overnight. Dr. Solomon Andrews never went up again, *Aereon II* crumbled into decay, and its inventor died in 1872. He took with him to the grave the tantalizing belief that an airship could be flown without power—and no one has done it since. ■

Pilot BRIEFS

■ WHERE TO GET AVGAS is one of the most important questions of the day for aircraft operators. To help pilots find the answer more quickly FAA, in cooperation with fixed base operators (FBOs), is now compiling a daily fuel status report. Made up of data provided voluntarily by FBOs to Flight Service Stations, the report includes critical information such as the lack of certain grades of fuel or the inability of FBOs to fuel transient aircraft. This data is fed into FAA's telecommunications network, and upon request will be given to pilots by FSSs, centers, National Weather Service field offices and some FBOs. So far, cooperation by industry has been good and the service has been received enthusiastically by the public.

■ BONEHEAD OF THE MONTH award goes to a commercial multi-engine pilot whose certificate was suspended for 45 days recently, for the following violations: operating a twin-engine aircraft in a domestic Air Defense Identification Zone (ADIZ) without having filed a flight plan, and without a functioning two-way radio; landing at a controlled airport without ATC clearance; and leaving the airplane parked with both engines running. The pilot had to scramble frantically back on board the airplane when the unattended twin began to move.

■ GETTING TO THE POINTS. Iridium spark plugs have a number of superior qualities, but they also require extra care. Because iridium alloy work-hardens at a faster rate than platinum, overworking of the metal is to be avoided. Experienced mechanics have found that due to the small erosion rate of iridium plugs it is not necessary to reset the spark plug gap every 100 hours. Instead they inspect, lightly clean, and re-install. The electrodes are adjusted only when the gaps reach .023 or .024 inches (well within the manufacturer's specifications). Using this method rather than resetting the gap every 100 hours keeps bending of the ground electrodes to a minimum, with less chance of work-hardening the iridium electrodes and eventually breaking them off.

■ SINGLE PILOT IFR HELICOPTER CERTIFICATION? The answer will be yes--if the machine is stable enough--according to James F. Rudolph, Director of Flight Standards Service at FAA. Rudolph has made it clear (in answer to a charge that FAA is dragging its feet on the IFR situation) that FAA would certificate a helicopter for single pilot IFR operation if and when cockpit workload drops to a level that would allow safe operation by a normal pilot just two feet, two hands and two eyes. "If a helicopter requires a third hand to tune the radio, then it's going to have to have two pilots for IFR operations," Mr. Rudolph told a meeting of the Helicopter Association of America at San Diego recently. Rudolph suggested that operators let manufacturers know what kind of helicopters they want. If they want IFR helicopters they should stop buying VFR models and then complain about not being able to fly them IFR.

ACCIDENTS, FATALITIES, RATES
U.S. GENERAL AVIATION
1962-1973

YEAR	ACCIDENTS TOTAL	ACCIDENTS FATAL	FATALITIES	AIRCRAFT-HOURS FLOWN (000)	AIRCRAFT-MILES FLOWN (000)	ACCIDENT RATES PER 100,000 AIRCRAFT-HOURS FLOWN TOTAL	PER 100,000 AIRCRAFT-HOURS FLOWN FATAL	PER MILLION AIRCRAFT-MILES FLOWN TOTAL	PER MILLION AIRCRAFT-MILES FLOWN FATAL
1962	4,840	430	857	14,500	1,964,586	33.4	2.97	2.46	0.219
1963	4,690	482	893	15,106	2,048,574	31.0	3.19	2.29	0.235
1964	5,069	526	1,083	15,738	2,180,818	32.2	3.34	2.32	0.241
1965	5,196	538	1,029	16,733	2,562,380	31.1	3.22	2.03	0.210
1966	5,712	573	1,151**	21,023	3,336,138	27.2	2.73	1.71	0.172
1967	6,115	603	1,333**	22,153	3,439,964	27.6	2.72	1.78	0.175
1968*	4,968	692	1,399	24,053	3,700,864	20.6	2.86	1.34	0.186
1969	4,767	647	1,495**	25,351	3,926,461	18.8	2.55	1.21	0.164
1970	4,712	641	1,310	26,030	3,207,127***	18.1	2.46	1.47	0.200
1971	4,651	662	1,405	25,512	3,143,181	18.2	2.59	1.48	0.211
1972	4,228	683	1,400**	27,300EST	3,400,000EST	15.4	2.52	1.24	0.200
1973P	4,180	701	1,340	28,200EST	3,500,000EST	14.8	2.49	1.19	0.200

P PRELIMINARY

* COMMENCING JANUARY 1, 1968, THE DEFINITION OF SUBSTANTIAL DAMAGE WAS CHANGED, THEREFORE, FEWER ACCIDENTS WERE REPORTED. CARE SHOULD BE USED IN COMPARING WITH SIMILAR DATA FOR PRIOR YEARS.

** INCLUDES AIR CARRIER FATALITIES (1966—2, 1967—104, 1969—82, 1972—5) WHEN IN COLLISION WITH GENERAL AVIATION AIRCRAFT.

*** BEGINNING IN 1970, THE DECREASE IN AIRCRAFT-MILES FLOWN IS THE RESULT OF A CHANGE IN THE FAA STANDARD FOR ESTIMATING MILES FLOWN.

General Aviation Accident Rates Decrease in 1973

General aviation aircraft, which includes all non-air carrier civilian flying, had fewer total accidents (fatal and non-fatal) in 1973 than in any year since 1956 and the total accident rate per hours flown was down over the previous year, according to National Transportation Safety Board safety statistics. The rate of fatal general aviation accidents, also decreased, although the number of fatal accidents rose.

Rule for Transponder Tests Eased

The date for aircraft operators to comply with the new test and inspection requirements for transponders has been postponed from January 1, 1974, to January 1, 1976, with periodic checks every other year, rather than every year, as originally proposed. The change in compliance was based on public comments received by FAA, some of which raised the question whether existing repair stations could handle the test and inspection of the estimated 60,000 transponders used by civil aircraft.

The two-year interval between transponder inspections will allow them to be checked on the same schedule that is required for altimeter checks under another rule.

Basic Helicopter Handbook Revised

The "Basic Helicopter Handbook," AC 61-13A, has been revised by FAA and is now available. The handbook provides guidance for applicants preparing for private, commercial, and flight instructor pilot certificates with helicopter rating, regardless of the make or model of helicopter. The book covers helicopter aero-dynamics, performance and flight maneuvers, and is recommended for flight instructors as a training aid as well as for students. AC 61-13A, is available for $1.30 from the Superintendent of Documents, GPO, Washington, D.C. 20402, or at government bookstores.

FAA ALERT LIST

The following aircraft were listed at press time with the FAA Office of Air Transportation Security as stolen or missing:

American A2A	N9798M	Poughkeepsie, N.Y.
Beech 65A	N297GB	Dallas
Cessna 172	N3011U	Albany, N.Y.
Cessna 182	N2079O	Kansas City, Mo.
Cessna 210	N3708Y	Albuquerque
Cessna 210	N3808Y	Washington, D.C.
Cessna 210	N3884Y	Ontario, Cal.
Cessna 310	N3092D	Oakland, Cal.
Piper PA-18	N1139A	Anchorage
Piper PA-28	N6542J	Ontario, Cal.
Piper PA-32	N8919N	Yuma
Piper PA-32	N40959	Vero Beach

If you see any of these aircraft advise the nearest FAA flight service station at once. Of course, any listed plane may since have been recovered by the owner. If your aircraft is stolen, notify the local police and flight service station.

Short Haul Noise Limits Studied

An advance notice of proposed rule making has been issued by FAA for purposes of developing appropriate noise regulations for potential short haul aircraft, including vertical takeoff and landing (VTOL), short takeoff and landing (STOL), and reduced takeoff and landing (RTOL).

The notice proposes a number of specific questions regarding the compliance times, altitude and power/thrust restrictions, economic incentives for maximum noise reductions, predictability of noise and the definition of short haul for noise reduction purposes. The notice (73-32) appeared in the Federal Register December 28. Deadline for comments is March 1, 1974.

Rock Beds Contain Fuel Spill Fires

Beds of crushed stone can help prevent fuel spill fires at airports and fuel tank farms, according to tests conducted by FAA's National Aviation Facilities Experimental Center (NAFEC) at Atlantic City, N.J. During experiments, avgas vapors could not be ignited on, nor a flame made to spread across, the surface of a bed of ⅜-inch stone, when the fuel surface was an inch or more below the level of the rock.

The tests suggested that rock beds could be useful along the shoulders and at the ends of runways, in refueling areas and wherever aircraft or ground vehicles move.

NOAH'S HELPER. The versatile helicopter adds one more to its list of accomplishments, as it is utilized to lift a 750 pound fiberglass elephant to the roof of the six-story Noah's Ark Motor Inn at St. Charles, Mo. *(St. Louis Helicopter Airways photo.)*

FAA Aviation News welcomes comments from the aviation community. We will reserve this page for an exchange of views. No anonymous letters will be used, but names will be withheld on request.

• How High Can Birds Fly?

I am a graduate student in biology at Texas Tech University presently beginning research on sandhill cranes and other large birds.

A recent article entitled Operation Lights On (Aviation News, October 1973) discusses records of bird strikes and also research being done in the area. I would appreciate it if you could inform me where I could get details on this information.

Thomas J. Salb, Jr.
Lubbock, Tex.

The Canada Goose migration study mentioned in the article was undertaken jointly by the Air Force and Johns Hopkins University. At Johns Hopkins you may contact Dr. William Sladen. You may also address yourself to the Eco-Systems Technical Section, Environics Branch, Kirtland AFB, New Mexico 87119, Attn: Captain Jim O'Rourke.

• The Other Side

Concerning the Forum letter on "Women as Pilots" in your November issue, please inform Mr. Williams that "silly stunts" are not confined to women—as witnessed by *this* certificated flight instructor.

Furthermore, tell Mr. Williams to get off your backs—FAA AVIATION NEWS appears to be the only aviation publication that even tries to give women a fair break.

Francine L. Bowman
Arlington, Va.

• Closed Airports and Rotating Beacons

I have a question about the rotating green and white airport beacon. Recently a *Cherokee* crashed while attempting a night landing at Charlottesville, Va. The rotating beacon was on, but no runway lights. The pilot decided to land because of radio failure. He landed safely but then hit a part of the runway which was under construction and the plane was destroyed. NOTAMS for this period indicate the airport was closed for repairs. Doesn't the rotating beacon indicate an operating field?

Frederick B. Heath, Jr.
Chester, Va.

Not necessarily. At an airport that is temporarily *closed FAA standards call for the rotating beacon to be operating while the runway and approach lights are turned off. In addition, the white cross(es) that signal daytime pilots that the airport is closed should be lighted at night so that they are visible from the air. This information is contained in AC 150/5340-1D, and is but one of many airport standards which are set out in FAA Advisory Circulars and incorporated into FAR Part 152 "by reference".*

However, only airports that have received Federal funds are required *to meet these and other prescribed FAA airport standards, and while many other airports do so voluntarily, it is not safe for a pilot to assume that this will always be the case. The pilot has the responsibility for making sure before landing that the runway is safe. Hence, it is always advisable to check NOTAMs for airports along your route before making a cross country flight—day or night.*

• Safety Council Disowns It

A recent Forum item, "Santa's Sleigh After FAA and OSHA Requirements Have Been Met," in your December 1973 issue was erroneously attributed to the National Safety Council. Numerous similar cartoons have circulated recently and I wish to emphasize that, however humorous, the National Safety Council is in no way responsible for their creation or distribution.

Robert C. Waterbury
National Safety Council

With all due respect to our good friend Jerry Jerome, the Mark II-A "Santa's Sleigh" first appeared in our publication, the U.S. Army Agency for Aviation Safety's "SYSTEM SAFETY NEWSLETTER."

W. F. Gabella
LTC, U.S. Army
Fort Rucker, Ala.

• Saving Fire Victims

Theoretically your "Fighting Aircraft Fires" (August 1973) makes sense; however, neither experience nor practice supports your advocacy of extensive ground base fire/rescue units. For all air carrier operations world-wide there are an average of 16 accidents a year in which fire, minor as well as major, is present. About 50% of these occur on or near an airport. My own study of these accidents from 1954 to 1970 shows an average of slightly less than one fatal accident per year, in which lives *might* have been saved assuming an adequate and efficient CFR service (well-trained firemen using airport-based ground fire fighting units) available in each case. Lack of prompt notification, terrain problems, limitations of men and machines have precluded even the best of CFR units from being effective and no amount of Federal Regulation or wishful thinking promise to improve this picture.

F. Russell Hoyt
Rockville, Md.

As Executive Director of American Association of Airport Executives, you are obviously familiar with the records concerning the use of crash, fire, and rescue equipment at airports under emergency conditions. Records are not available, however, to indicate how often CFR equipment has responded to prevent ignition of fuel spills, to cool or stand by hot brake situations, or take other actions to prevent a minor fire from developing into a major fire.

Incidentally, although standards for CFR equipment are only required at air carrier airports certificated under FAR Part 139, the safety of general aviation users of these airports is also enhanced.

• Electronic Calculators

I find it interesting with the influx on the consumer market of pocket calculators/computers that the FAA AVIATION NEWS has not done a story regarding the pros and cons of pocket calculators vs. old established hand computers (E-6B). The new electronic calculators of which I speak, in my mind, are faster, just as accurate if not more so, and in some cases comparable in size to the E-6B type computer.

If I've missed a story on this subject in your publication would you please furnish me with a copy if at all possible.

John T. Vitovic
Little Falls, N.J.

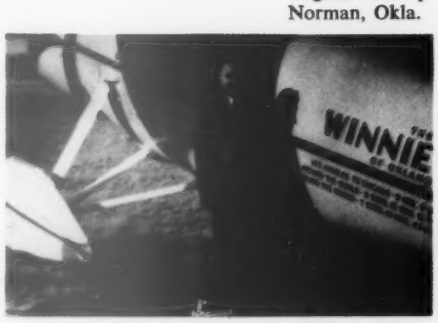
For pilots who are accurate and speedy in their use, pocket calculators can undoubtedly be helpful and time-saving during preflight planning. However FAR Part 91.19 expressly forbids the use of portable electronic devices (with certain named exceptions) on air carrier, commercial or IFR operations unless the aircraft operator is sure *that the device will not cause interference with navigation or communication. Preliminary evidence indicates that some (not all) battery-operated pocket calculators do indeed affect ADF and VOR systems.*

No previous article on the subject has appeared in this magazine.

• About Wiley Post

Although I have been a subscriber to FAA AVIATION NEWS since 1966, I do not recall any articles about Wiley Post. So I thought it would be in order to suggest that you either have an article on Wiley Post or arrange to reprint the recent interesting feature on this remarkable aviator in "Oklahoma Today."

Eugene F. Culp
Norman, Okla.



In August 1966 FAA AVIATION NEWS printed an article called "Wiley Post: The Man Who Shrank the Globe". Post followers might be interested in a Smithsonian "Annals of Flight" paperback book, Wiley Post, His Winnie Mae and the World's First Pressure Suit, *by Stanley Mohler and Bobby Johnson, Available from Superintendent of Documents, U.S. GPO, Washington, D.C. 20402, for $1.50.*

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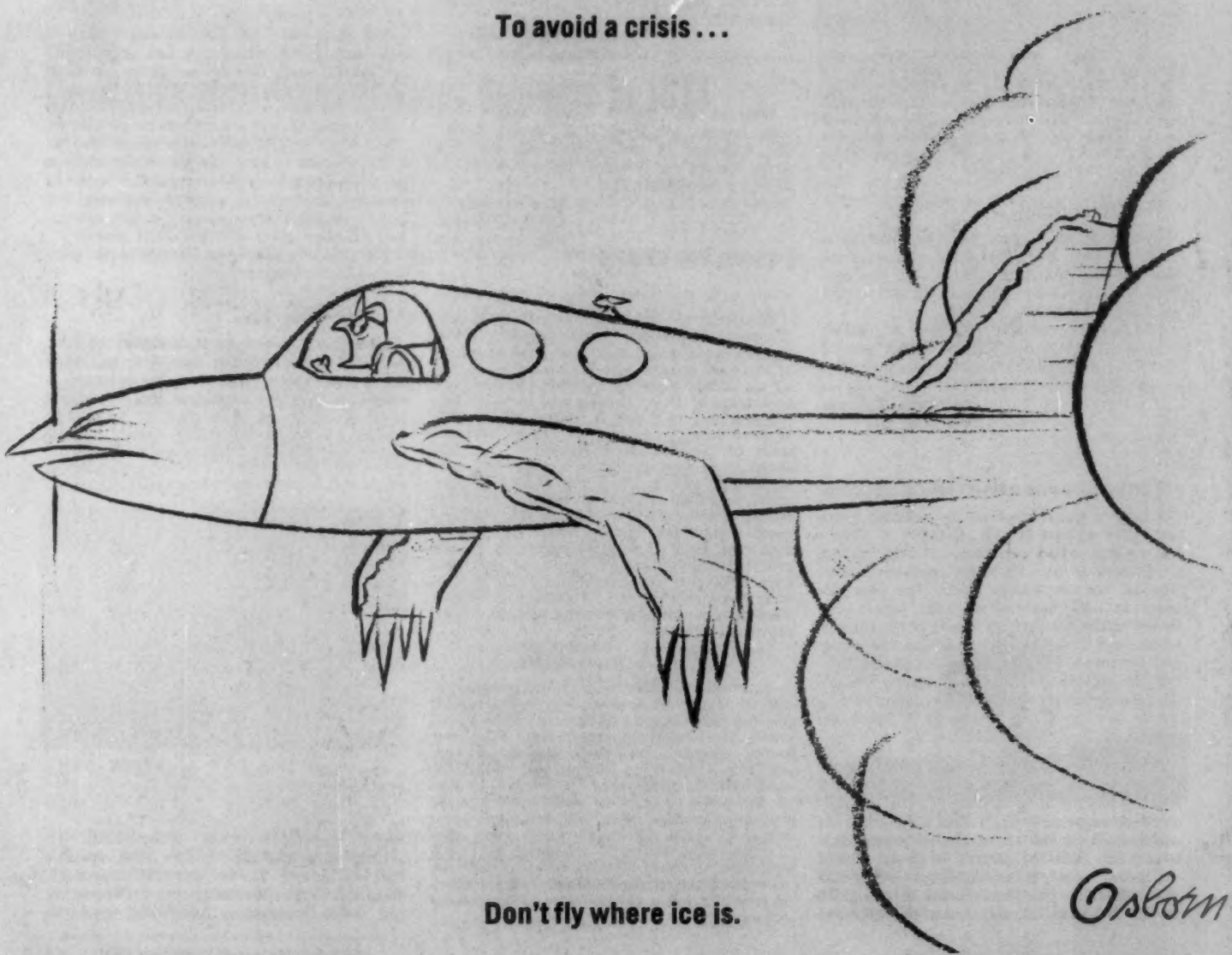

Don't fly where ice is.

Osborn

Suggested by Andrew Rupnick, Pittsburgh FSS